

"I know what we're going to do today."

Agenda:

supplies needed: graph paper, rulers, tape measures



- 1) Bell Ringer- Go over lesson 12 homework with 7:00 buddy
- 2) Ratios and Proportions Lesson 13:
 - How do you create scaled drawing?
- 3) Homework: scale drawing of a room in your house

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Lesson Summary:

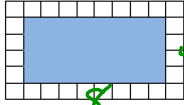
Given the scale factor r representing the relationship between scale drawing length and actual length, the square of this scale factor, r^2 , represents the relationship between scale drawing area and actual area.

For example, if 1 inch on the scale drawing represents 4 inches of actual length, then the scale factor, r , is $\frac{1}{4}$. On this

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Problem Set

1. The shaded rectangle shown below is a scale drawing of a rectangle whose area is 288 square feet. What is the scale factor of the drawing? (Note: each square on grid has a length of 1 unit)



Ratio of areas

$$\frac{4 \div 4}{36 \div 4} = \frac{1}{9}$$

actual \times S.D. $\frac{288}{32}$

SD area = $8 \cdot 4 = 32$

$$\frac{32 \div 2}{288 \div 2} = \frac{16 \div 4}{144 \div 4} = \frac{4}{36}$$

$r = \text{Scale factor}$

$r^2 = \text{areas}$

$$\sqrt{\frac{1}{9}} = \frac{1}{\sqrt{9}}$$

$$r = \frac{1}{3}$$

$r^2 = \frac{1}{9}$

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2. A floor plan for a home is shown below where $\frac{1}{2}$ inch corresponds to 6 feet of the actual home. Bedroom 2 belongs to 13-year old Kassie, and bedroom 3 belongs to 9-year old Alexis. Kassie claims that her younger sister, Alexis, got the bigger bedroom, is she right? Explain.

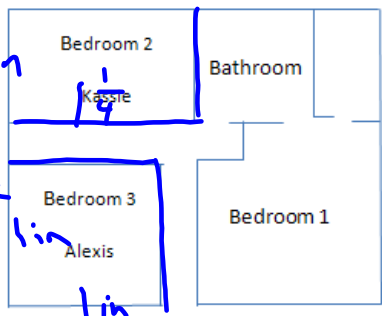
Kassie

$$\frac{3}{4} \times 9 \text{ ft}$$

$$1 \frac{1}{4} \text{ in} = 15 \text{ ft}$$

$$\text{area } 9 \times 15 = 135 \text{ ft}^2$$

Alexis

$$12 \times 12 = 144 \text{ ft}^2$$


$\frac{1}{2} \text{ in} = 6 \text{ ft}$

$1 \text{ in} = 12 \text{ ft}$

$\frac{3}{4} \text{ in} =$

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5

5

25 ft²

5

P = 20 ft

A = 25 ft²

3

7

21 ft²

P = 20 ft

A = 21 ft²

Oct 6-8:21 AM

3. On the mall floor plan, $\frac{1}{4}$ inch represents 3 feet in the actual store.

a. Find the actual area of Store 1 and Store 2.

b. In the center of the atrium, there is a large circular water feature that has an area of $\frac{9}{64}$ square inches on the drawing. Find the actual area in square feet.

$\frac{1}{4}$

3

$\frac{1}{4}$

12

$\frac{1}{4}$

15

$\frac{1}{6}$

$\frac{1}{4}$

21 ft

18 ft = $1\frac{7}{16}$ in

Store 1

$31\frac{1}{2} \times \frac{1}{4} = 7\frac{1}{2}$

ft 2

9 = 378

Mall Entrance

$1\frac{1}{4}$

15 ft

Store 2

315 ft²

To Atrium and Additional Stores

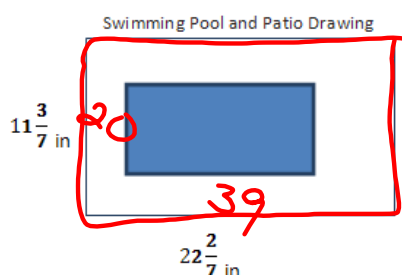
$r = 12$

$r^2 = 144$

$\frac{9}{64} \times 144 = 20.25$

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4. The greenhouse club is purchasing seed for the lawn in the school courtyard. They need to determine how much to buy. Unfortunately, the club meets after school, and students are unable to find a custodian to unlock the door. Anthony suggests they just use his school map to calculate the amount of area that will need to be covered in seed. He measures the rectangular area on the map and finds the length to be 10 inches and the width to be 6 inches. The map notes the scale of 1 inch representing 7 feet in the actual courtyard. What is the actual area in square feet?
5. The company installing the new in-ground pool in your back yard has provided you with the scale drawing shown below. If the drawing uses a scale of 1 inch to $1\frac{3}{4}$ feet, calculate the total amount of two-dimensional space needed for the pool and its surrounding patio.



$$1 \text{ in} = 1\frac{3}{4} \text{ ft}$$

$$11\frac{3}{7} \text{ in} = 20 \text{ ft}$$

$$22\frac{2}{7} \text{ in} = 39 \text{ ft}$$

$$\text{area} = 20 \times 39 = 780 \text{ ft}^2$$

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Lesson 13: An Exercise in Creating a Scale Drawing

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Today, you will be applying your knowledge from working with scale drawings to create a floor plan for your idea of the dream classroom.

Classwork: Your Dream Classroom

Guidelines

Take measurements: All pairs will work with the perimeter of the classroom as well as the doors and windows (Perimeter to be given by the teacher). Use the table provided to record measurements. Always double check the measurements.

Create your dream classroom and use the furniture catalog to pick out your furniture: Discuss what your ideal classroom will look like with your partner and start picking out furniture from the catalog. Record the actual measurements on the given table.

Determine scale and calculate scale drawing lengths and widths: With your partner, determine your own scale. The calculations of the scale drawing lengths, widths and area is to be included.

Scale Drawing: Using a ruler and referring back to the calculated scale length, draw the scale drawing including the doors, windows and furniture.

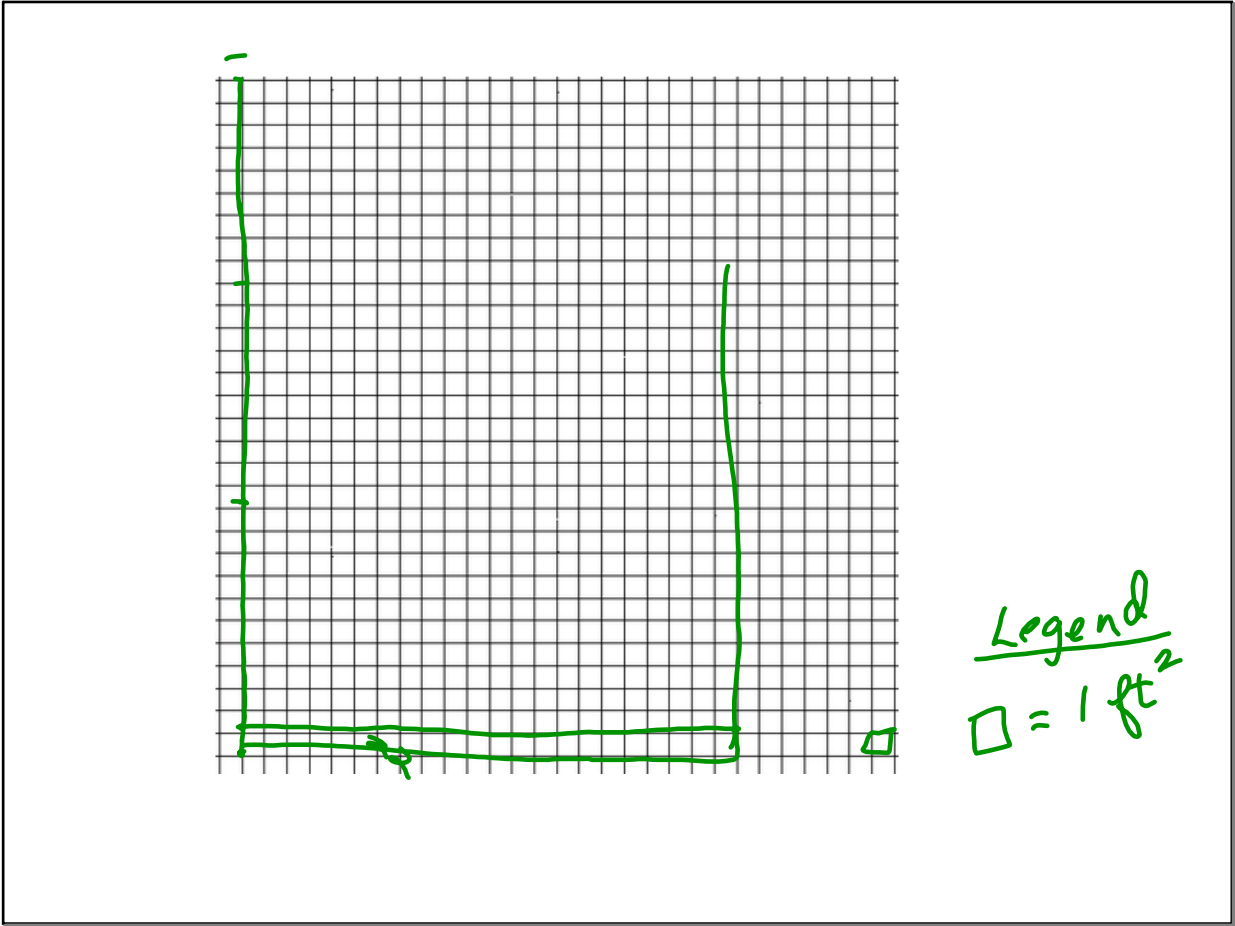
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Measurements

	Classroom Perimeter	Windows	Door	Additional Furniture					
Actual : Length	30ft	21ft	3ft						
Width	22 ft								
Scale Drawing : Length	30								
Width									

Scale: $\square = ft^2$

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Area							
	Classroom						
Actual Area							
Scale Drawing Area							

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Lesson Summary:**Scale Drawing Process:**

1. Measure lengths and widths carefully with a ruler or tape measure. Record in an organized table.
2. Calculate the scale drawing lengths, widths and areas using what was learned in previous lessons.
3. Calculate the actual areas.
4. Begin by drawing the perimeter, windows and doorways.
5. Continue to draw the pieces of furniture making note of placement of objects (distance from nearest wall).
6. Check for reasonableness of measurements and calculations.

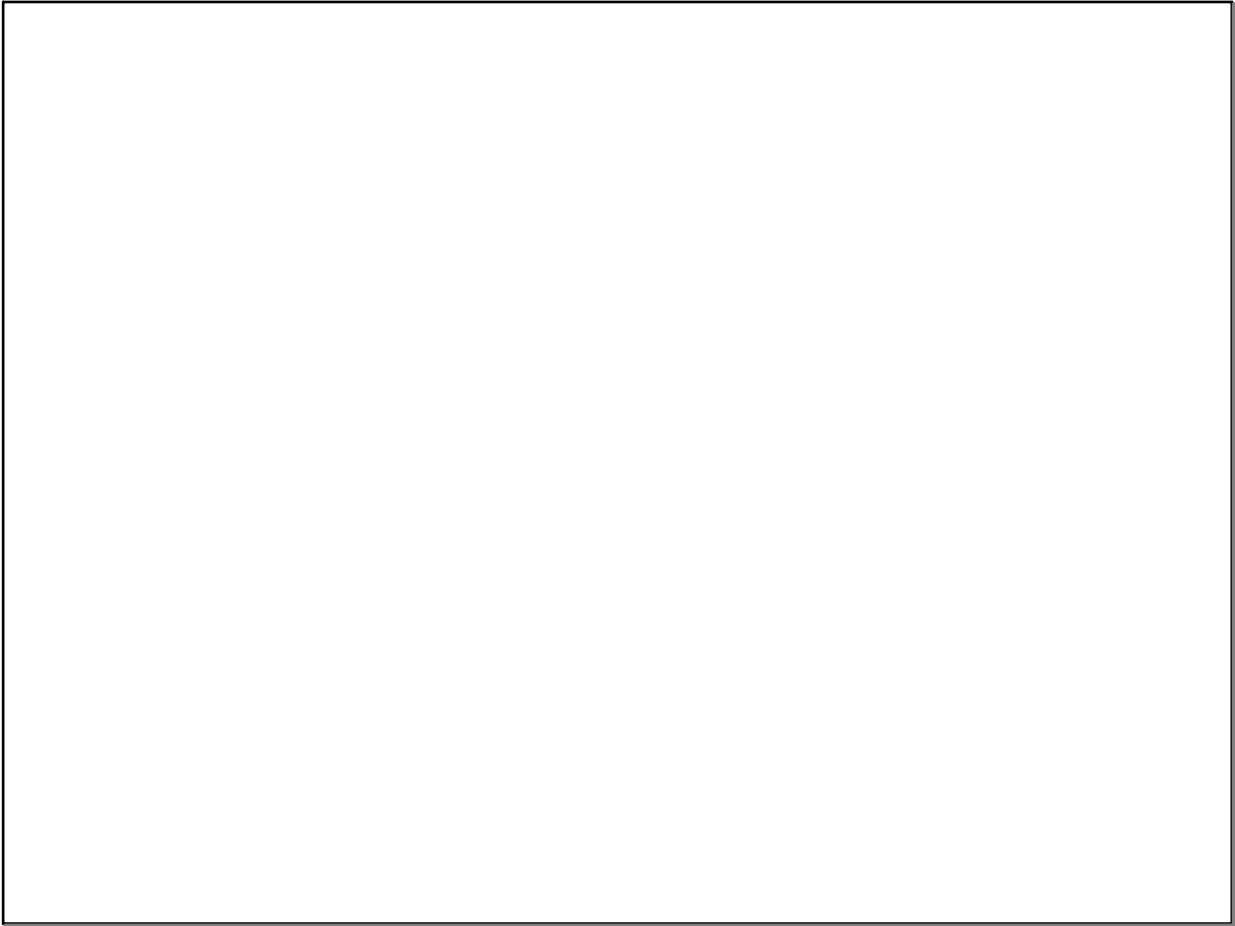
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Problem Set**Interior Designer**

You won a spot on a famous interior designing TV show! The designers will work with you and your existing furniture to redesign a room of your choice. Your job is to create a top-view scale drawing of your room and the furniture within it.

1. With the scale factor being $\frac{1}{24}$, create a scale drawing of your room or other favorite room in your home on a sheet of 8.5 x 11 inch graph paper.
- Include the perimeter of the room, windows, doorways, and three or more furniture pieces (such as tables, desks, dressers, chairs, bed, sofa, ottoman, etc.).
 - Use the table to record lengths and include calculations of areas.
 - Make your furniture "moveable" by duplicating your scale drawing and cutting out the furniture.
 - Create a "before" and "after" to help you decide how to rearrange your furniture. Take a photo of your "before."
 - What changed in your furniture plans?
 - Why do you like the "after" better than the "before"?

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